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JAPANESE PATENT OFFICE

PATENT ABSTRACTS OF JAPAN

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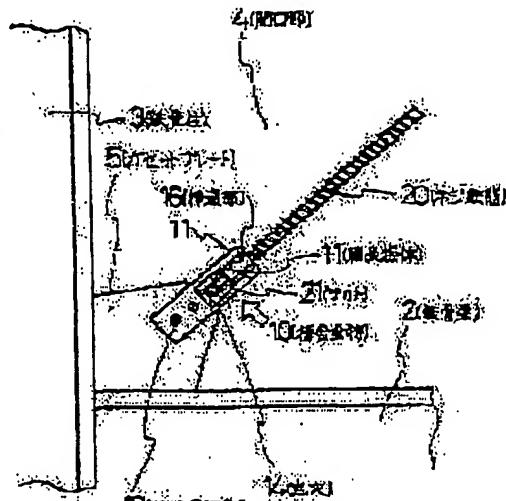
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KITAMURA TAKESHI
ISHIZUKI MASAHIRO
MASUDA TOMOMI
SUZUKI TAKAKIMI
TATEISHI SHINICHI

(54) BRACE END JOINING STRUCTURE AND JOINING FITTING

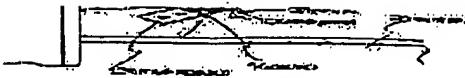
(57) Abstract:

PURPOSE: To improve the extent of reliability even from the standpoint of strength by requiring no member for connecting screw members themselves for a coupler and a tumbuckle or the like, reducing the number of members, and making a job for assemblage performable simply and quickly as well as preventing a brace from being connected in the midway.

CONSTITUTION: A bolt through hole 13 in the thickness direction of a plate body 11 is installed at the rear end side of a slender plate body 11, and a thickness direction window hole 14 is formed in a central part of the slender plate body 11, using a joining fitting 10 provided with an insertional part 16 of a cylindrical threaded reinforcing bar having a tip and the window hole 14 of the slender plate body 11 interconnected to each other. In succession, the rear end side of this joining fitting 10 is bolted to a gusset plate 5 at the



building body side via the bolt through hole 13, and the threaded reinforcing bar 20 serving as a brace is pierced through the reinforcing insertional part 16 from the tip side. Then, a clamping nut 21 is screwed in a projecting end of the threaded reinforcing bar 20 in the window hole 14.



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CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION
TECHNICAL PROBLEM MEANS OPERATION EXAMPLE DESCRIPTION OF DRAWINGS DRAWINGS

CLAIMS

[Claim(s)]

[Claim 1] Prepare the bolt breakthrough of the thickness orientation of this **** in the back end side of *****, and **** of the thickness orientation is formed in the center section of this *****. The junction hardware which prepared the insertion section of cylinder-like screw reinforcement which makes the nose of cam and this **** of this ***** open for free passage is used. The bolt setting of the back end side of this junction hardware is carried out to the gusset plate by the side of a building main part through the above-mentioned bolt breakthrough. Brace edge junction structure characterized by making the screw reinforcement which serves as a brace from a nose of cam side at the insertion section of reinforcement penetrate, binding tight at the vegetation edge of the screw reinforcement in the above-mentioned ****, and screwing the nut of business.

[Claim 2] The brace edge junction hardware characterized by having prepared the bolt breakthrough of the thickness orientation of this **** in the back end side of *****, and preparing the insertion section of cylinder-like screw reinforcement which **** of the thickness orientation is formed [section] in the center section of this *****, and makes the nose of cam and this **** of this ***** open for free passage.

[Claim 3] The bolt breakthrough of the thickness orientation of this **** is prepared here as two forks with which **** of two sheets consists and is [opening] concurrent in the back end of *****. Form **** of the thickness orientation in the center section of this *****, use the junction hardware which prepared the insertion section of cylinder-like screw reinforcement which makes the nose of cam and this **** of this ***** open for free passage, and the gusset plate by the side of a building main part is inserted in the opening by the side of the back end of this junction hardware. The bolt setting of the back end side of this junction hardware is carried out to the gusset plate by the side of a building main part through the above-mentioned bolt breakthrough. Brace edge junction structure characterized by making the screw reinforcement which serves as a brace from a nose of cam side at the insertion section of reinforcement penetrate, binding tight at the vegetation edge of the screw reinforcement in the above-mentioned ****, and screwing the nut of business.

[Claim 4] The brace edge junction hardware characterized by preparing the insertion section of cylinder-like screw reinforcement which the bolt breakthrough of the thickness orientation of this **** is prepared [section] here, and **** of the thickness orientation is formed [section] in the center section of this *****, and makes the nose of cam and this **** of this ***** open for free passage as two forks with which **** of two sheets consists and is [opening] concurrent in the back end of *****.

[Claim 5] The bolt breakthrough of the thickness orientation is prepared in each **** as two forks with which **** of two sheets consists and is concurrent in an opening. what ***** becomes in piles about **** of two sheets -- it is -- the back end side of ***** -- this -- **** of the thickness orientation is formed in each **** in the center section of this *****, and this is made into one **** in piles. in the nose of cam side of this ***** The brace edge junction hardware characterized by constituting the insertion section of cylinder-like screw reinforcement which makes the above-mentioned **** and a nose of cam open for free passage from doubling the curving section of the semicircle cylinder formed in each ****.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the junction hardware used for the edge junction structure of the brace arranged in the beam and beam of the effective area surrounded with the cylinder and beam of for example, a steel-structure building, and a roof side, and it.

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[0002]

[Description of the Prior Art] As such a brace, the screw reinforcement 1 which is shown in drawing 9 may be used, and a male screw 6 is projected also from the gusset plate 5 side of **** of opening 4, and as a junction of the edge, this screw reinforcement 1 edge and the male screw 6 are bolted with a coupler 7 or a turnbuckle, and it has joined together. Two in drawing shows a steel frame beam, and 3 shows a steel frame cylinder.

[0003] by the way, this male screw 6 -- other edges -- bolt insertion -- what was fabricated as a part of junction hardware (considering a configuration a paddle bolt is called) which has the monotonous section 9 which drilled the hole 8 -- it is -- the monotonous section 9 of this junction hardware -- a gusset plate 5 -- pile doubling and bolt insertion -- bolt setting is carried out by the high strength bolt etc. through a hole 8

[0004]

[Problem(s) to be Solved by the Invention] With the junction structure of the brace edge shown in this drawing 9, the fraction which it is trouble that the work which bolts screw reinforcement 1 edge and the male screw 6, and is combined with a coupler 7 or a turnbuckle adjusts the bolting force to both sides etc., and has this coupler 7 and turnbuckle will be connected, middle [in a brace].

[0005] Since the purpose of this invention cancels un-arranging of the above-mentioned conventional example, its member which combines both screw members, such as a coupler and a turnbuckle, is unnecessary, has few member mark, and is made simply [assembly operation] and quickly and a brace is not connected on the way, it is in offering brace edge junction structure reliable also in intensity, and a junction hardware.

[0006]

)[Means for Solving the Problem] In order that this invention may attain the above-mentioned purpose, the bolt breakthrough of the thickness orientation of this **** is prepared in the back end side of *****. Form **** of the thickness orientation in the center section of this *****, and the junction hardware which prepared the insertion section of cylinder-like screw reinforcement which makes the nose of cam and this **** of this ***** open for free passage is used. The bolt setting of the back end side of this junction hardware is carried out to the gusset plate by the side of a building main part through the above-mentioned bolt breakthrough. The screw reinforcement which serves as a brace from a nose of cam side at the insertion section of reinforcement is made to penetrate, it binds tight at the vegetation edge of the screw reinforcement in the above-mentioned ****, and the nut of business is screwed. Furthermore, a junction hardware prepares the bolt breakthrough of the thickness orientation of this **** here as two forks with which **** of two sheets consists an opening in the back end of *****, and is concurrent. ***** is what the thing established for the insertion section of cylinder-like screw reinforcement which **** of the thickness orientation is formed [section] in the center section of this.*****, and makes the nose of cam and this **** of this ***** open for free passage, or a junction hardware becomes in piles about **** of two sheets. The bolt breakthrough of the thickness orientation is prepared in each **** as two forks with which **** of two sheets consists and is concurrent in an opening. the back end side of ***** -- this -- **** of the thickness orientation is formed in each **** in the center section of this *****, and this is made into one **** in piles. in the nose of cam side of this ***** Let it be a summary to constitute the insertion section of cylinder-like screw reinforcement which makes the above-mentioned **** and a nose of cam open for free passage from doubling the curving section of the semicircle cylinder formed in each ****.

[0007]

[Function] According to this invention, the insertion section of screw reinforcement will be secured to a gusset plate side by carrying out the bolt setting of the ***** as a junction hardware to the gusset plate by the side of a building main part.

[0008] Therefore, this insertion section is made to penetrate the screw reinforcement used as a brace, it binds tight at the vegetation edge of the screw reinforcement in ****, if the nut of business is screwed, it will become that to which screw reinforcement does not slip out of the insertion section with this nut, and it binds tight with the nut of a parenthesis, the force can be given, and screw reinforcement is united with a gusset plate through a junction hardware.

[0009] Thus, although transmission of the stress from a gusset plate flows to the screw reinforcement as a brace smoothly through a junction hardware, since the insertion section of cylinder-like screw reinforcement is located in the center of ***** as for a junction hardware, the heart of screw

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reinforcement and the heart of a junction hardware agree mostly. Consequently, even if it pulls into a junction hardware and the force is applied, the force with a gusset plate impossible for is not applied, but it can also be prevented that this gusset plate bends.

[0010]

[Example] Hereafter, the example of this invention is explained in detail about a drawing. Drawing 1 is the front view showing one example of the brace edge junction structure of this invention, and gives the same reference-mark number to the same component as the drawing 10 showing the above-mentioned conventional example. Although ten in drawing is a junction hardware, when this is explained previously, as shown in drawing 2 and the drawing 3, 11 in drawing is ***** what ***** 11 becomes in piles about **** 11a and 11b of two sheets by casting or the forging press – it is -- a back end side -- this -- **** 11a and 11b of two sheets makes an opening 12 the two forks which consist and are concurrent

[0011] And the bolt breakthrough 13 of the thickness orientation is formed in each **** 11a and 11b, **** 14 of the thickness orientation is formed in this forked fraction in the center section of proper number **** and this ***** 11 at each **** 11a and 11b, and this is made into one *** in piles. Furthermore, at the nose of cam side of this ***** 11, the curving section 15 of a semicircle cylinder is formed in each **** 11a and 11b, and the insertion section 16 of cylinder-like screw reinforcement which makes above-mentioned **** 14 and a nose of cam open for free passage consists of doubling this curving section 15. In addition, although illustration is omitted, each **** 11a and 11b turns into ***** 11 mutually fixed by bolt setting or the spot welding.

[0012] Although the gusset plate 5 is formed in the corner of the opening 4 surrounded with the steel frame beam 2 and the steel frame cylinder 3 as shown in drawing 1, a gusset plate 5 is inserted in the opening 12 by the side of the back end of this junction hardware 10, and through the above-mentioned bolt breakthrough 13, with a high strength bolt 17 and the nut 18, a washer 19 is made to intervene and it fixes. If it does in this way, the side with *** 14 and the insertion section 16 of ***** 11 projects from a gusset plate 5.

[0013] Although it was the screw reinforcement as a brace, 20 in drawing made the insertion section 16 of reinforcement penetrate the nose of cam of this screw reinforcement 20 from the nose of cam side of ***** 11, was bound tight at the vegetation edge of the screw reinforcement 20 in above-mentioned *** 14, made the washer 22 intervene and screwed the nut 21 of business. Thus, a nut 21 is bound tight to the screw reinforcement 20, the force is given, and transmission of the stress from a gusset plate 5 flows to the screw reinforcement 20 as a brace smoothly through the junction hardware 10.

[0014] Moreover, since the insertion section 16 is located in a center, as for ***** 11, the heart of the screw reinforcement 20 and the heart of ***** 11 agree mostly. Consequently, even if it pulls to ***** 11 and the force is applied, the force with a gusset plate 5 impossible for is not applied, but it can prevent that this gusset plate 5 bends.

[0015] Drawing 4 shows the 2nd example of the brace edge junction hardware of this invention, and although ***** 11 used as the junction hardware 10 was created as one sheet things, such as steel casting, it made the back end of this ***** 11 the two forks which *** 11c and 11d of two sheets consists an opening 12, and are concurrent. Other configurations are the same as that of above-mentioned view 2 and the drawing 3, the bolt breakthrough 13 of the *** [this / 11c and 11d] thickness orientation was formed, *** 14 of the thickness orientation was formed in the center section of this ***** 11, and the insertion section 16 of cylinder-like screw reinforcement which makes the nose of cam and this *** 14 of this ***** 11 open for free passage was formed.

[0016] The brace edge junction structure of this invention using the junction hardware 10 in this 2nd example is the same as that of the case where the 1st above-mentioned example explains drawing 1, almost.

[0017] It considered as the thing with one sheet, without drawing's 5 showing the 2nd example of the brace edge junction hardware of this invention, and creating ***** 11 used as the junction hardware 10 as one sheet things, such as steel casting, and also making the back end section into two forks. Drawing 6 and the drawing 7 are examples of the deformation, and drawing 8 is still another modification and they give a radius of circle suitably. in addition, when it considers as the thing with one sheet, without also making these back end section into two forks The back end section which forms the bolt breakthrough 13 brings the heart close to the center of the insertion section 16 of the screw reinforcement of the shape of a cylinder which is in the front end section at least. When the fraction of this bolt breakthrough 13 was

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fixed in piles on a gusset plate 5, it considered so that the heart of the screw reinforcement 20 and the heart of ***** 11 might agree mostly.

[0018] As brace edge junction structure, it is the same as that of the 1st above-mentioned example, and the bolt setting of the back end side is carried out to the gusset plate 5 by the side of a building main part through the bolt breakthrough 13 of the junction hardware 10, and the screw reinforcement 20 which serves as a brace from a nose of cam side at the insertion section 16 of reinforcement is made to penetrate, it binds tight at the vegetation edge of the screw reinforcement 20 in *** 14, and the nut 21 of business is screwed.

[0019] In addition, if a gusset plate 5 is formed in the edge of a steel frame when arranging the screw reinforcement 20 other than the slanting brace shown in drawing 1 as a level brace, although illustration is omitted, the brace edge junction structure of this invention is applicable.

[0020]

[Effect of the Invention] As stated above, the brace edge junction structure and the junction hardware of this invention have the unnecessary member which combines both screw members, such as a coupler and a turnbuckle, and have few member mark, and assembly operation can also be made simply and quick. Moreover, since a brace consists of only screw reinforcement and a part for a connection is not produced on the way, either, it is reliable also in intensity.

[0021] Furthermore, it can prevent that the force with a gusset plate impossible for is not applied even if it pulls into a junction hardware and the force is applied, since the heart of screw reinforcement and the heart of a junction hardware agree mostly, but this gusset plate turns [junction].

)Field

[Field of the Invention] This invention relates to the junction hardware used for the edge junction structure of the brace arranged in the beam and beam of the effective area surrounded with the cylinder and beam of for example, a steel-structure building, and a roof side, and it.

[0002]

Technique

[Description of the Prior Art] As such a brace, the screw reinforcement 1 which is shown in drawing 9 may be used, and a male screw 6 is projected also from the gusset plate 5 side of *** of opening 4, and as a junction of the edge, this screw reinforcement 1 edge and the male screw 6 are bolted with a coupler 7 or a turnbuckle, and it has joined together. Two in drawing shows a steel frame beam, and 3 shows a steel frame cylinder.

[0003] by the way, this male screw 6 -- other edges -- bolt insertion -- what was fabricated as a part of junction hardware (considering a configuration a paddle bolt is called) which has the monotonous section 9 which drilled the hole 8 -- it is -- the monotonous section 9 of this junction hardware -- a gusset plate 5 -- pile doubling and bolt insertion -- bolt setting is carried out by the high strength bolt etc. through a hole 8

Effect

[Effect of the Invention] As stated above, the brace edge junction structure and the junction hardware of this invention have the unnecessary member which combines both screw members, such as a coupler and a turnbuckle, and have few member mark, and assembly operation can also be made simply and quick. Moreover, since a brace consists of only screw reinforcement and a part for a connection is not produced on the way, either, it is reliable also in intensity.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] With the junction structure of the brace edge shown in this drawing 9, the fraction which it is trouble that the work which bolts screw reinforcement 1 edge and the male screw 6, and is combined with a coupler 7 or a turnbuckle adjusts the bolting force to both sides etc., and has this coupler 7 and turnbuckle will be connected, middle [in a brace].

[0005] Since the purpose of this invention cancels un-arranging of the above-mentioned conventional example, its member which combines both screw members, such as a coupler and a turnbuckle, is unnecessary, has few member mark, and is made simply [assembly operation] and quickly and a brace is not connected on the way, it is in offering brace edge junction structure reliable also in intensity, and a junction hardware.

MEANS

[Means for Solving the Problem] In order that this invention may attain the above-mentioned purpose, the bolt breakthrough of the thickness orientation of this **** is prepared in the back end side of *****. Form **** of the thickness orientation in the center section of this *****, and the junction hardware which prepared the insertion section of cylinder-like screw reinforcement which makes the nose of cam and this **** of this ***** open for free passage is used. The bolt setting of the back end side of this junction hardware is carried out to the gusset plate by the side of a building main part through the above-mentioned bolt breakthrough. The screw reinforcement which serves as a brace from a nose of cam side at the insertion section of reinforcement is made to penetrate, it binds tight at the vegetation edge of the screw reinforcement in the above-mentioned ****, and the nut of business is screwed. Furthermore, a junction hardware prepares the bolt breakthrough of the thickness orientation of this **** here as two forks with which **** of two sheets consists an opening in the back end of *****, and is concurrent. ***** is what the thing established for the insertion section of cylinder-like screw reinforcement which **** of the thickness orientation is formed [section] in the center section of this *****, and makes the nose of cam and this **** of this ***** open for free passage, or a junction hardware becomes in piles about *** of two sheets. The bolt breakthrough of the thickness orientation is prepared in each *** as two forks with which **** of two sheets consists and is concurrent in an opening. the back end side of ***** -- this -- **** of the thickness orientation is formed in each *** in the center section of this *****, and this is made into one *** in piles. in the nose of cam side of this ***** Let it be a summary to constitute the insertion section of cylinder-like screw reinforcement which makes the above-mentioned *** and a nose of cam open for free passage from doubling the curving section of the semicircle cylinder formed in each ***.

[0007]

OPERATION

[Function] According to this invention, the insertion section of screw reinforcement will be secured to a gusset plate side by carrying out the bolt setting of the ***** as a junction hardware to the gusset plate by the side of a building main part.

[0008] Therefore, this insertion section is made to penetrate the screw reinforcement used as a brace, it binds tight at the vegetation edge of the screw reinforcement in ****, if the nut of business is screwed, it will become that to which screw reinforcement does not slip out of the insertion section with this nut, and it binds tight with the nut of a parenthesis, the force can be given, and screw reinforcement is united with a gusset plate through a junction hardware.

[0009] Thus, although transmission of the stress from a gusset plate flows to the screw reinforcement as a brace smoothly through a junction hardware, since the insertion section of cylinder-like screw reinforcement is located in the center of *****, as for a junction hardware, the heart of screw reinforcement and the heart of a junction hardware agree mostly. Consequently, even if it pulls into a junction hardware and the force is applied, the force with a gusset plate impossible for is not applied, but

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it can also be prevented that this gusset plate bends.

EXAMPLE

[Example] Hereafter, the example of this invention is explained in detail about a drawing. Drawing 1 is the front view showing one example of the brace edge junction structure of this invention, and gives the same reference-mark number to the same component as the drawing 10 showing the above-mentioned conventional example. Although ten in drawing is a junction hardware, when this is explained previously, as shown in drawing 2 and the drawing 3, 11 in drawing is *****. what ***** 11 becomes in piles about **** 11a and 11b of two sheets by casting or the forging press -- it is -- a back end side -- this -- **** 11a and 11b of two sheets makes an opening 12 the two forks which consist and are concurrent [0011] And the bolt breakthrough 13 of the thickness orientation is formed in each **** 11a and 11b, **** 14 of the thickness orientation is formed in this forked fraction in the center section of proper number **** and this ***** 11 at each **** 11a and 11b, and this is made into one *** in piles. Furthermore, at the nose of cam side of this ***** 11, the curving section 15 of a semicircle cylinder is formed in each **** 11a and 11b, and the insertion section 16 of cylinder-like screw reinforcement which makes above-mentioned **** 14 and a nose of cam open for free passage consists of doubling this curving section 15. In addition, although illustration is omitted, each **** 11a and 11b turns into ***** 11 mutually fixed by bolt setting or the spot welding.

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[0015] Drawing 4 shows the 2nd example of the brace edge junction hardware of this invention, and although ***** 11 used as the junction hardware 10 was created as one sheet things, such as steel casting, it made the back end of this ***** 11 the two forks which **** 11c and 11d of two sheets consists an opening 12, and are concurrent. Other configurations are the same as that of above-mentioned view 2 and the drawing 3, the bolt breakthrough 13 of the *** [this / 11c and 11d] thickness orientation was formed, **** 14 of the thickness orientation was formed in the center section of this ***** 11, and the insertion section 16 of cylinder-like screw reinforcement which makes the nose of cam and this **** 14 of this ***** 11 open for free passage was formed.

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a cylinder which is in the front end section at least. When the fraction of this bolt breakthrough 13 was fixed in piles on a gusset plate 5, it considered so that the heart of the screw reinforcement 20 and the heart of ***** 11 might agree mostly.

[0018] As brace edge junction structure, it is the same as that of the 1st above-mentioned example, and the bolt setting of the back end side is carried out to the gusset plate 5 by the side of a building main part through the bolt breakthrough 13 of the junction hardware 10, and the screw reinforcement 20 which serves as a brace from a nose of cam side at the insertion section 16 of reinforcement is made to penetrate, it binds tight at the vegetation edge of the screw reinforcement 20 in *** 14, and the nut 21 of business is screwed.

[0019] In addition, if a gusset plate 5 is formed in the edge of a steel frame when arranging the screw reinforcement 20 other than the slanting brace shown in drawing 1 as a level brace, although illustration is omitted, the brace edge junction structure of this invention is applicable.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] Drawing 1 is the front view showing the 1st example of the brace edge junction structure of this invention.

[Drawing 2] It is the perspective diagram showing the 1st example of the brace edge junction hardware of this invention.

[Drawing 3] It is the front view showing the 1st example of the brace edge junction hardware of this invention.

[Drawing 4] It is the perspective diagram showing the 2nd example of the brace edge junction hardware of this invention.

[Drawing 5] It is the perspective diagram showing the 3rd example of the brace edge junction hardware of this invention.

[Drawing 6] It is the front view showing the 4th example of the brace edge junction hardware of this invention.

[Drawing 7] It is the side elevation showing the 4th example of the brace edge junction hardware of this invention.

[Drawing 8] It is the front view showing the 5th example of the brace edge junction hardware of this invention.

[Drawing 9] It is the front view showing the conventional example.

[Description of Notations]

1 -- Screw reinforcement 2 -- Steel frame beam

3 -- Steel frame cylinder 4 -- Opening

5 -- Gusset plate 6 -- Male screw

7 -- coupler 8 -- bolt insertion -- hole

9 -- Monotonous section 10 -- Junction hardware

11 -- ***** 11a, 11b, 11c, 11d -- ***

)12 -- Opening 13 -- Bolt breakthrough

14 -- *** 15 -- The curving section of a semicircle cylinder

16 -- Insertion section 17 -- Bolt

18 -- Nut 19 -- Washer

20 -- Screw reinforcement 21 -- Nut

22 -- Washer

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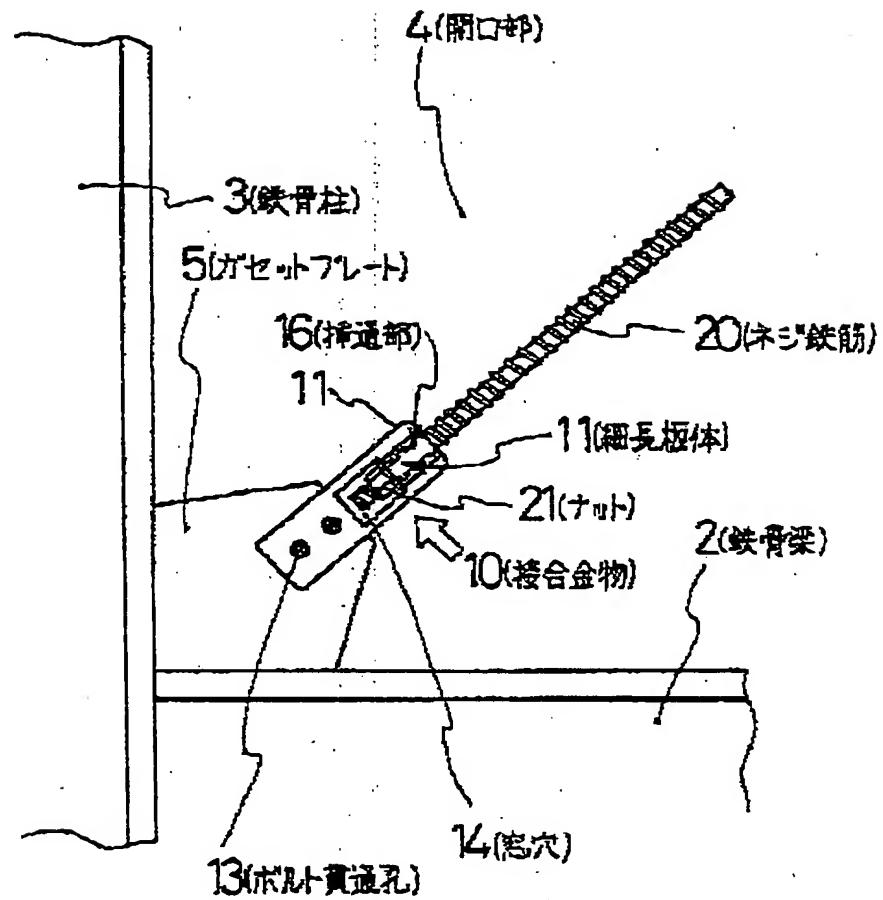
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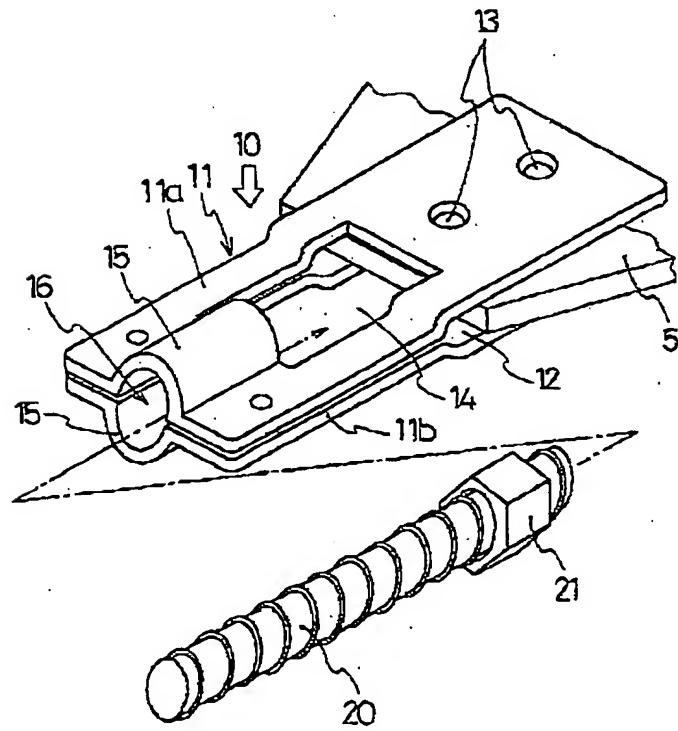
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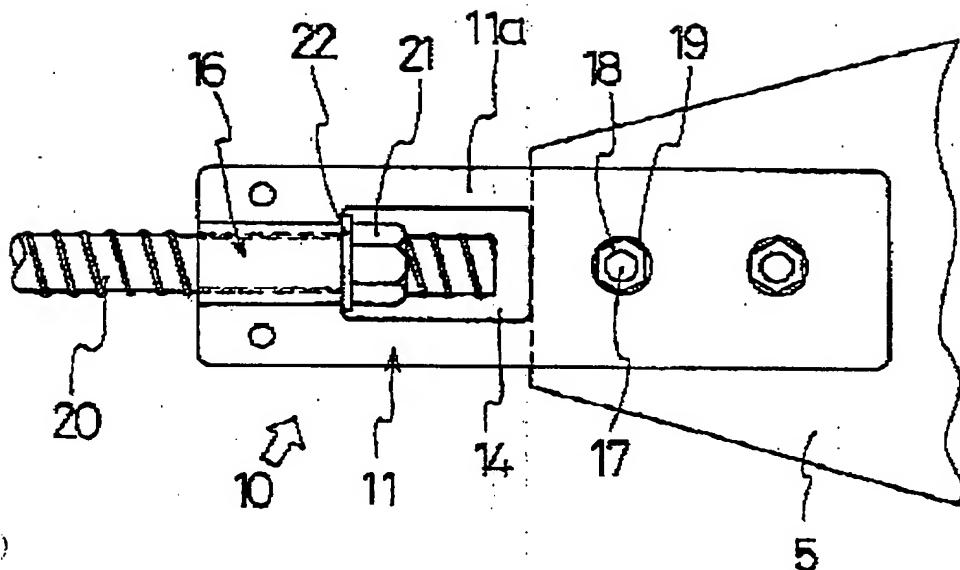
Drawing 1.



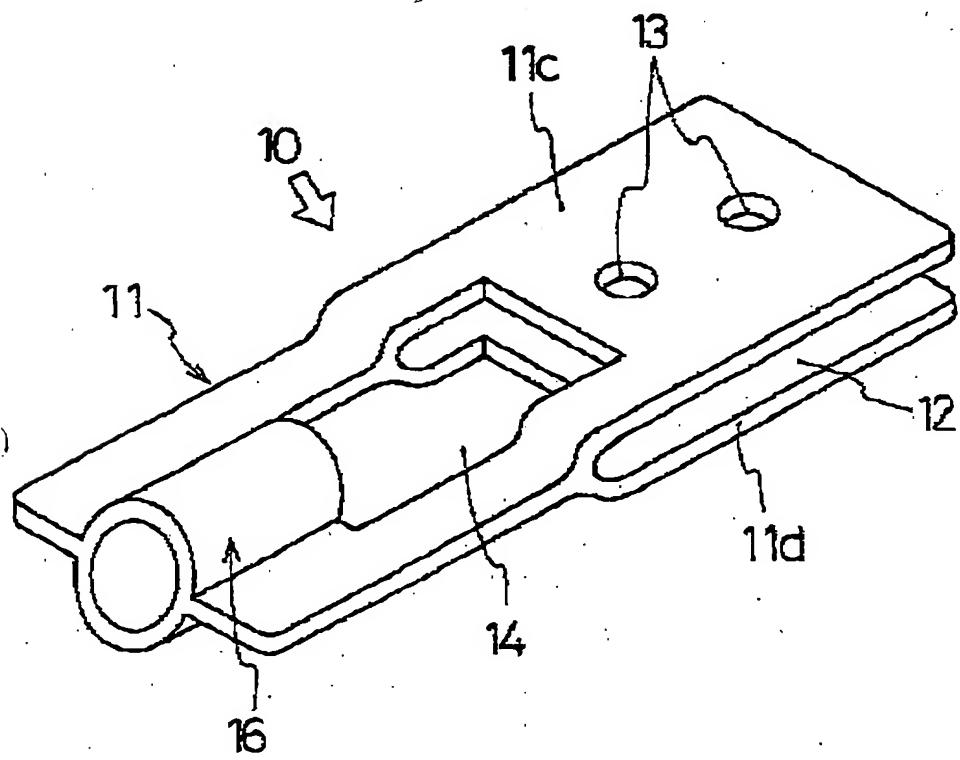
Drawing 2



Drawing 3



Drawing 4

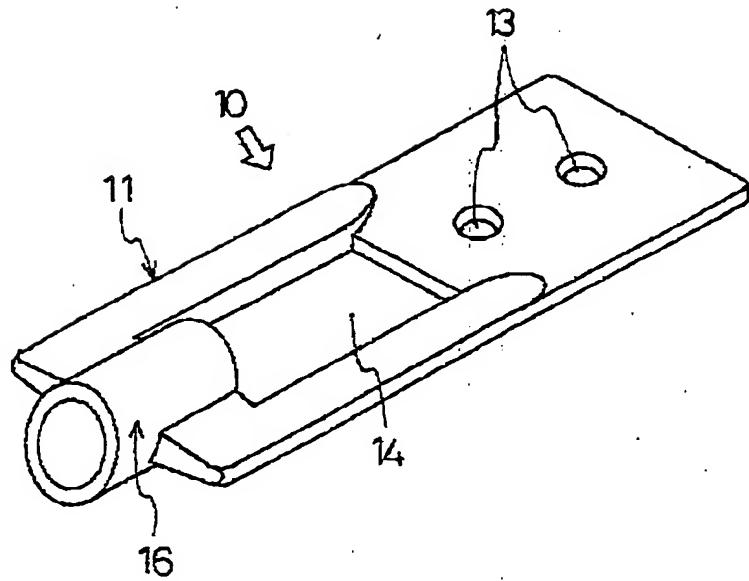


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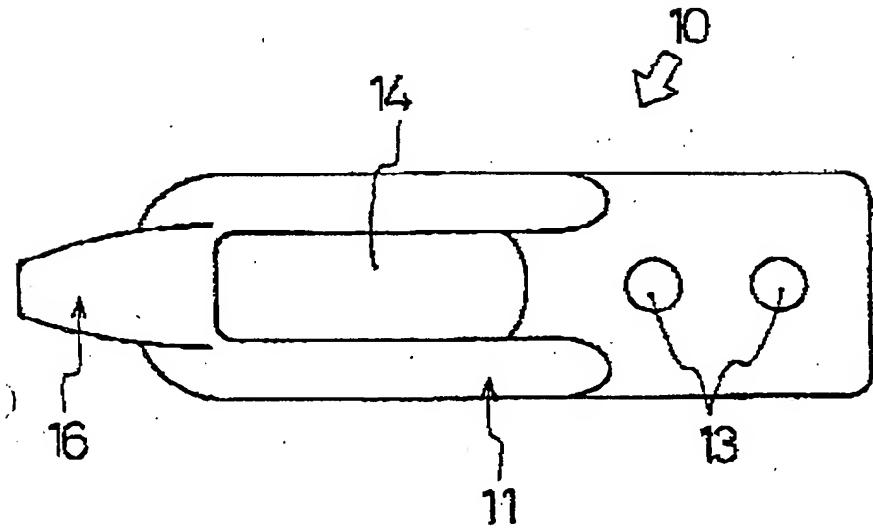
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Drawing 5



Drawing 6

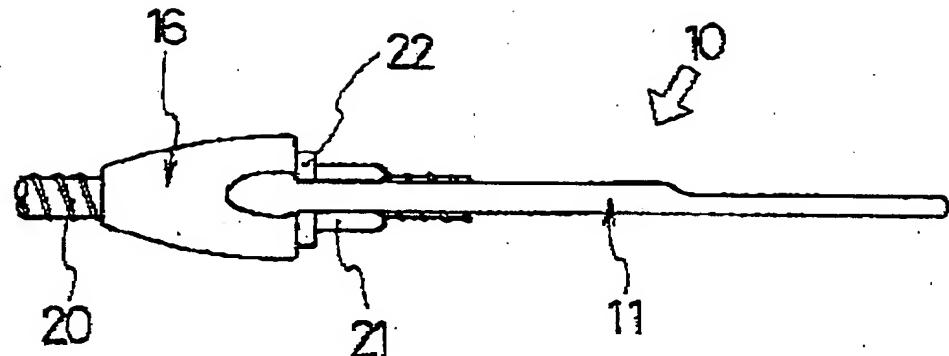


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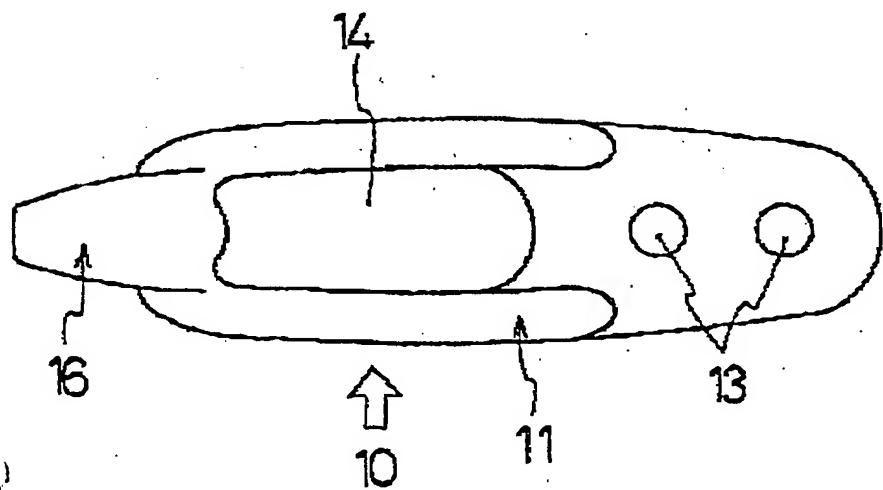
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Drawing 7



Drawing 8

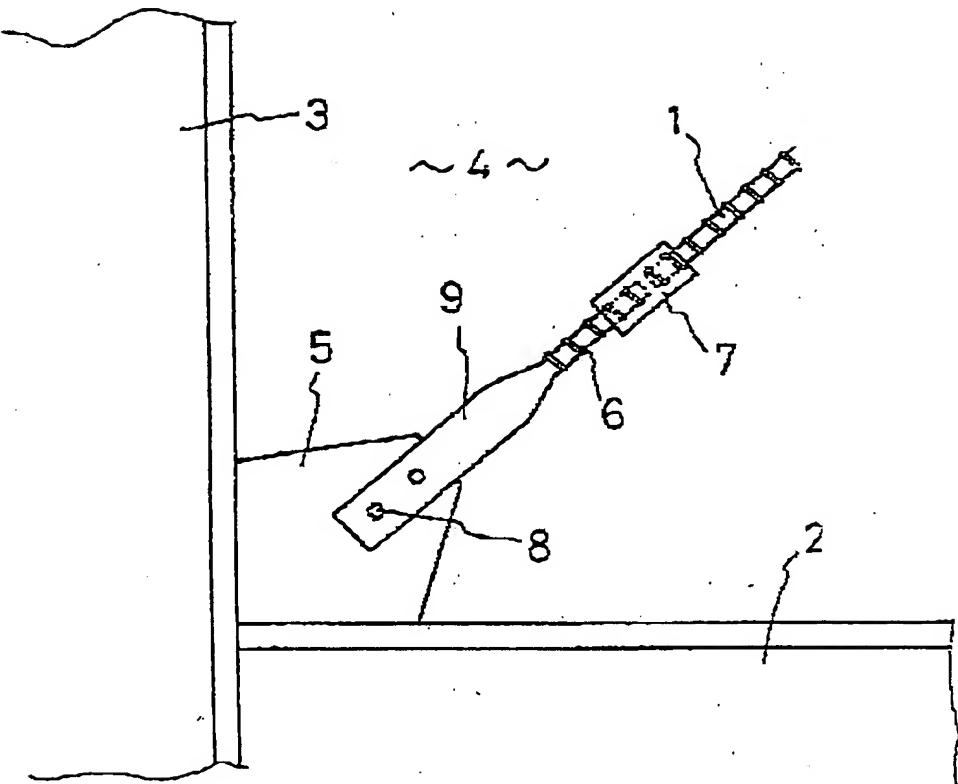


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Drawing 9



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